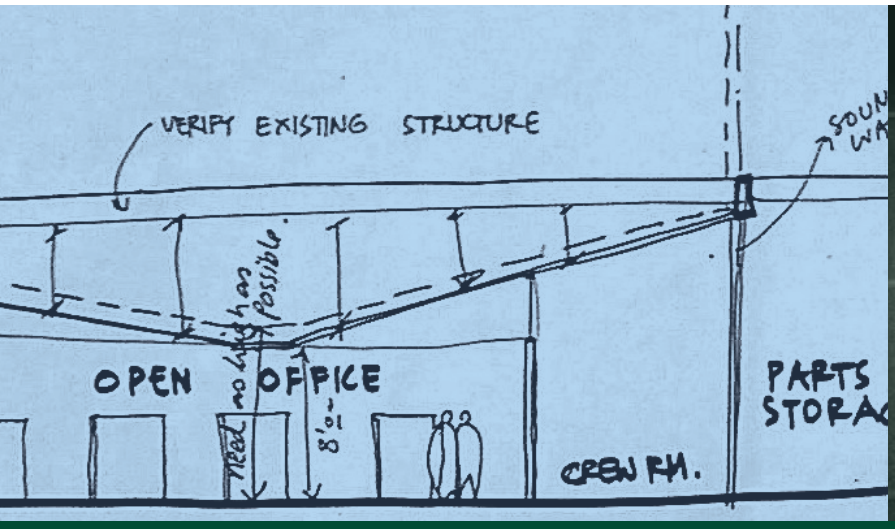
SECTION 8 - SUSTAINABLE CONSTRUCTION DOCUMENTS

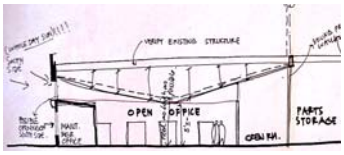
Iowa Sustainable Design Initiative



SECTION 8 - SUSTAINABLE CONSTRUCTION DOCUEMNTS

Sustainable Construction Documents

Introduction



Daylighting Conceptual Plan

Construction documents are the written and graphic documents prepared by the design professional for communicating the project design to the contractor that will construct the building. Sustainable goals and requirements that are developed by the project team and incorporated in the design must be formalized and included in the construction documents in order for them to become a reality in the completed project. Construction documents consist of drawings and specifications and together with the Conditions of the Contract and other documents, form the legally binding requirements of the contract between the owner and the construction contractor.

Construction documents are frequently referred to as the drawings and specifications for the project. Both drawings and specifications are necessary to completely describe the work to be performed by the contractor.

For those not familiar with construction documents, the following is a brief overview of the major components and how they are different for projects using sustainable practices.

Sustainable Specification Language:

1.2 SUBMITTALS

A. Project Information:

1. Certification of preservation or fire retardant treated material.
2. Fasteners approved for use of preservative or fire retardant treated material.
3. Chain of Custody documents for FSC Certified Wood products.
4. Documentation of SCS Certification.
5. Certification of compliance with ANSI Standards for Biobased Composite Boards.

Drawings

The drawings are the graphical representation of the project. Drawings that are part of the construction documents differ from drawings presented earlier in the design process; final drawings are as accurate as possible and illustrate exactly how the components of the building will be assembled to produce the finished project. They are drawn to scale and dimension, and where necessary, portions of the drawings are blown up to large scale to show all details. Types of drawings necessary for a typical building project consist of the following:

- site plans;
- floor plans:
- door, window, and room finish schedules;
- building elevations (exterior and interior);
- building sections;
- wall sections;
- architectural details;
- mechanical plans, details, and schedules; and
- electrical plans, details, and schedules.

Sustainable Construction Documents

Sustainable drawings may, at first glance, appear to be no different than drawings for a project that does not incorporate sustainable principles. The difference is in the design and the features that the drawings describe. Sustainable drawings may also have additional descriptive notes for the contractor.

Specifications

Although drawings are often thought of as the key element in communicating the design to the contractor, specifications are at least equally important and arguably more important. Specifications define in writing the qualitative requirements for products, materials, and workmanship for the construction contractor. A simple definition of the word “specify” is to describe or define in detail. Whether specifying bricks, curtain wall systems, buildings or bridges, the specifications must describe completely all the materials and fabrication methods so that the object can be produced in accordance with the project requirements.

Sustainable specifications are different from non-green specifications only in their content. They define contractual requirements for the project as well as describe the materials and fabrication methods. The project design team will need to spend time researching products that may be different from the standard products they have used in the past. Accurately incorporating sustainable requirements into the specification may be time consuming at first. With a thoughtful approach and an integrated team, this can be done with minimal impact on the time required. Education, organization, experience, and cooperation are the keys to success.

What are the Contract Documents?

According to the Construction Specifications Institute (CSI) Manual of Practice (MOP), contract documents consist of the following items:

- contract forms;
- conditions of the contract;
- specifications;
- drawings;
- addenda; and
- contract modifications.

The Bidding Requirements are not contract documents, because they are not used once the contract has been executed.

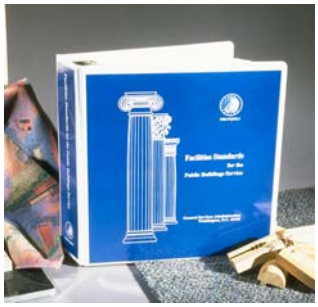
Sustainable Construction Documents

What is CSI?

CSI is the Construction Specifications Institute, a professional organization comprised of a broad range of industry and professional members. CSI was formed in 1948 and its primary contribution to the construction industry is to provide organizational formats and tools. These tools have become the standard for communicating and managing the administrative and design requirements for construction projects. CSI also developed the Manual of Practice, which serves as the primary guide to understanding specifications, including how to write and organize them, and how to manage the construction process effectively. To learn more about CSI and the tools they offer, go to www.csinet.org.

What is MasterFormat™?

MasterFormat™ is the organizational structure for the documents as developed by CSI, and it includes the 16 Divisions of the specifications. It is a master list of numbers and titles for organizing information about construction requirements, products, and activities into a standard sequence.



Project Manual

What is a Project Manual?

The term “Project Manual” was originated by the American Institute of Architects (AIA) to replace the title “specifications” and to provide a standard location for the written documents for a project. Within the Project Manual are the bidding requirements, the contract forms, the conditions of the contract, and finally, the specifications. All of these documents are inter-related and they have a hierarchy as set forth in CSI’s MasterFormat™.

General Issues Regarding Sustainability and Specifications

It will become much easier to incorporate sustainable materials and technologies if the specifications are written correctly. Providing specifications that guide the project construction team and enable them to meet the project’s sustainable goals is an important task. Once the sustainable design goals are established, the materials, systems, and assemblies can be determined, and the sustainable requirements can be clearly defined in the specifications.

Selecting sustainable strategies can mean extra time researching unfamiliar products and technologies (which can be a daunting task). Refer to the table at the end of this section for sustainable product resources. Every project has its own set of decision and design parameters, and sustainable solutions can vary from project to project.

Sustainable Construction Documents

Goals vs. Requirements

In order to ensure the project's success, defining the project sustainable goals and requirements clearly is critical, and it is especially important that the person editing the specifications understands the distinction between sustainable goals and requirements. The definitions provided at http://www.dictionary.com are:

Goal: "The purpose toward which an endeavor is directed; an objective."

Requirement: "The act of requiring; demand; requisition."

Sustainable goals and requirements ultimately depend upon the project requirements as defined by the owner.

Requirements potentially have liability implications for the design professional, so it is important for the project manager to fully understand the ramifications of each sustainable requirement. For example, if the requirement for construction waste recycling was set at 75 percent, but it is found that this is not attainable at the project location, the designer will have to answer for the owner's potential financial losses. Construction waste recycling is becoming a source of profit for both the contractor and the owner. There are many issues to consider along with the sustainable elements: owner expectations, cost, time, codes, interrelationships between materials and systems, regional requirements, and so on. Setting the sustainable achievement bar at a realistic height is a critical component for success.

The initial discussions of the sustainable project goals and requirements typically take place during the sustainable design charrette, where the whole team has input and consideration can be given to all the potential ramifications to the project. In order to provide comprehensive specifications that truly serve the project, the specifier must be fully informed about the sustainable goals and requirements that are finally selected.

Documentation of Sustainable Design Decisions

It is highly recommended that the project team create a binder for collection and assembly of project information for tracking purposes during design. Create dividers according to CSI Divisions and Sections of the project, and make a copy of the binder information for the project specifier as decisions are finalized. Indicate the section number and the relevant sustainable goal/requirement on each cut sheet. Incorporating the sustainable information into a standard project binder for the materials, organized by CSI Divisions and Sections, will facilitate the submittal review process. Documenting and tracking the sustainable project information can be a time consuming and expensive task if it is

not done in a systematic way throughout the project. Whatever your preferred method may be, it is important to start the process at the beginning of a project.

Writing/Editing Specifications for Sustainability

To write good specifications, CSI suggests the four "c's": clear, complete, concise, and correct. The specifier must accurately communicate the owner's and designer's intentions to those doing the actual construction. This communication has become increasingly complex as our society and technology evolves, and sustainability brings additional multifaceted issues to the table.

Many of the specific sustainable design requirements need to be carried out by the construction team. Therefore, it is important that the construction team's responsibilities are clearly understood and that all documentation to be collected (for LEED for example) is included in submittal requirements. Also, because constructing a sustainable design project may be new to the construction team, making sure the team is a participating member will contribute to the success of the project.

Sustainable Specification Editing Tips

Division 1 – General Requirements

Division 1 – General Requirements should be thought of as a "coordinated package" for guiding the construction team and defining the administrative and procedural requirements for the project. This is where sustainable goals and requirements for the project are set forth. Within this division, the design professional should develop a separate specification section for defining the sustainable goals and requirements. It is here that the project construction team will go to find out what their primary tasks and responsibilities are regarding sustainability.

There are several examples of this type of section available, some in the public realm are free, and some can be purchased. AIA/MasterSpec, through their distributor ARCOM, has developed Section 01350, LEED Requirements, a very thorough and useful guide specification available to licensed MasterSpec users. The California Integrated Waste Management Board has developed Section 01350, Special Environmental Requirements, as part of their Reference Specifications for Energy and Resource Efficiency. We must caution you that this section does not relate directly to LEED and may be difficult for inexperienced specifiers to use.

The section on environmental requirements is the most important Division 1 Section for sustainable projects. The following items should be included in this section:

Sustainable Construction Documents

- Environmental Definitions: Basic definitions of environmental terms that apply to the project should be incorporated into this section. This provides definitions to those who may not be familiar with sustainable design terminology, and it also provides the project team with a common understanding for these terms. This helps not only to educate but also to diffuse any potential misunderstandings concerning terminology.

- Goals vs. Requirements: The specific project goals and requirements should be stated in this section. Take this into account when indicating "goals" instead of "requirements." The contractor will probably not be as responsive to goals as they will be to requirements. The term "goals" should only be used when the minimum requirement is also indicated.

For example: LEED Materials & Resources (MR) Credits 2.1 and 2.2, Construction Waste Management, require that 50 percent and 75 percent (by weight or volume), respectively, of construction waste be diverted from landfill. Credit MR 2.1 can be specified as the minimum requirement in an area where it is known to be attainable. Credit MR 2.2 may be specified as a goal if it is less likely that the 75 percent target can be reached. Remember that contractors do not always do things for idealistic or altruistic reasons. In this particular example, the contractor stands to save money on tipping fees if more construction waste is diverted from the landfill so there is a monetary incentive to meet the 75 percent goal.

- Environmental Project Manager: It is recommended that the specification include a requirement for the contractor to appoint an Environmental Project Manager. This person functions much like the sustainable coordinator on the design team, serving as: a conduit for sustainable communications, a guide to the construction team, and the point person responsible for gathering the sustainable documentation required from the contractor.

- Part 1, General Administrative Procedures: The Articles on Quality Assurance, Delivery Storage and Handling, Project Conditions, Cleaning and Protection, and Sequencing in Part 1 of this section should include specific environmental, administrative, and procedural requirements that apply to all other sections of the specification. These requirements might include submittals for Action Plans and Progress Reports so that the environmental requirements can be tracked as the project moves forward.

- Part 2, Products: Part 2 of this section should identify general environmental criteria for products according to the specific project sustainable strategies. Examples would include recycled content, low-emitting materials, and so on.

- Part 3, Installation: Part 3 of this section should specify general environmental procedures and practices for the project. Examples might include site clearing, construction waste management procedures, and indoor air quality management.

Other Division 1 Sections must be coordinated with the Environmental Requirements Section. For example, project meetings should include environmental issues on the progress meeting agenda and include the Environmental Project Manager as one of the contractor's attendees. Construction Waste Management should be developed as a new section, along with a new section on Indoor Air Quality Management. Submission of action plans and progress reports should be tied to applications for payment so they can be tracked easily. The submittal schedule should include environmental requirements.

Sustainable Technical Specification Sections

The editing of the remaining technical specification divisions depends on the design of the project, the products selected, and the sustainable goals and requirements pertaining to each particular section. The administrative and procedural requirements set forth in Division 1 govern Part 1, General, of each technical section. In order to collect as much sustainable documentation as possible from the contractor via the submittal process, specific environmental submittals should be indicated in Part 1, along with specifying special environmental performance requirements that apply to that section in Part 1. The editing of Part 2, Products, depends on the products selected. In addition to the normal editing for those products, sustainable standards and minimum environmental requirements for those products must be incorporated into the specifications.

Sample Sustainable Specification

Refer to the Appendix D for sustainable specification examples.

Related Resources

Contacts	Description	Contact Information
Bay Area Air Quality Management District	The Bay Area Air Quality Management District sets the nationally accepted standards for air quality.	Bay Area Air Quality Management District Offices 939 Ellis Street San Francisco, CA 94109 Telephone: (415) 771-6000 Website: **http://www.baaqmd.gov**
BuildingGreen.com	Building Green publishes the Environmental Building News, a publication of technical articles, product reviews, and information about events.	Environmental Building News - BuildingGreen, Inc. 122 Birge Street Suite 30 Brattleboro, VT 05301 Telephone: (802) 257-7300 Website: **http://www.buildinggreen.com**
Certified Forest Products Council	This site has research information about sustainable forestry practices and links to certified wood products and lumber.	Certified Wood & Paper Association 721 NW 9th Avenue, Suite 300 Portland, OR 97209 Telephone: (503) 224-7696 Website: **http://www.certifiedwood.org**

Sustainable Construction Documents

Related Resources (continued)

Contacts	Description	Contact Information
Environmental Protection Agency: EPA Protocol for Environmental Requirements, Baseline IAQ and Materials, for Research Triangle Park Campus, Section 01445	A good specification template when indoor air quality testing is a project requirement.	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 Telephone: (202) 272-0167 Website: **http://www.epa.gov/rtp/new-bldg/environmental/s_01445.htm**
Document No. 832R92005 - Storm Water Management For Construction Activities. Developing Pollution Prevention Plans And Best Management Practices. Washington, DC: EPA; 1992	As the title indicates, this is a guide for developing a good storm water management plan: available from the U.S. Department of Commerce, National Technical Information Service.	U.S. Department of Commerce Technology Administration National Technical Information Service Springfield, VA 22161 Telephone: (703) 605-6000 Website: **http://www.ntis.gov**
Forest Stewardship Council (FSC)	FSC publishes FSC 1.2-00: Principles and Criteria; search under the documents list, available in a .pdf format.	Forest Stewardship Council-U.S. 1155 30th Street NW Suite 300 Washington, DC 20007 Telephone: (202) 342-0413 Website: **http://www.fscoax.org/principal.htm**

Related Resources (continued)

Contacts	Description	Contact Information
Green Seal	The Green Seal program sets sustainable standards for products and materials.	Green Seal 1001 Connecticut Avenue, NW Suite 827 Washington, DC 20036-4324 Telephone: (202) 872-6400 Website: **http://www.greenseal.org**
Public Technology, Inc. and U.S. Green Building Council	Sustainable Building Technical Manual - Green Building Design, Construction, and Operation; a good all around technical resource. Available free in .pdf format to members of the U.S. Green Building Council and can be purchased by non-members.	U.S. Green Building Council 1015 18th Street, NW, Suite 805 Washington, DC 20036 Telephone: (202) 828-7422 Website: **http://www.usgbc.org**
Scientific Certification Systems	Provides independent third party environmental certification testing.	Food and Agriculture – U.S. Telephone: (510) 452-8012 Website: **http://www.scscertified.com/**

Sustainable Construction Documents

Related Resources (continued)

Contacts	Description	Contact Information
Silva Forest Foundation	This foundation works with communities to promote sustainable foresting practices; a good source of training and publications.	Silva Forest Foundation PO Box 9 Slocan Park British Columbia Canada V0G 2E0 Telephone: (250) 226-7222 Website: **http://www.silvafor.org**
SmartWood	Provides sustainable wood certification and information on sources for certified wood and wood products.	SmartWood Goodwin-Baker Building 65 Millet St. Suite 201 Richmond, VT 05477 USA Telephone: (802) 434-5491 Website: **http://www.smartwood.org**
South Coast Air Quality Management District	Sets the current national standard for minimizing VOCs in materials.	South Coast Air Quality Management District 21865 Copley Dr. Diamond Bar, CA 91765 Telephone: (800) 288-7664 Website: **http://www.aqmd.gov**

Related Resources (continued)

Contacts	Description	Contact Information
The Construction Specifications Institute	CSI publishes the CSI Manual of Practice, a primary reference for specification writers.	The Construction Specifications Institute 99 Canal Center Plaza, Suite 300, Alexandria, VA 22314 Telephone: (800) 689-2900 Website: **http://www.csinet.org**
US Green Building Council	A national coalition of leaders who promote buildings that are environmentally responsible.	U.S. Green Building Council 1015 18th Street, NW, Suite 805 Washington, DC 20036 Telephone: (202) 828-7422 Website: **http://www.usgbc.org**

Sustainable Construction Documents

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